Cisco 7000 Series

This chapter provides information on the Cisco 7000 series routers. The information is organized into the following sections:

- Product Overview
- Standard Features
- Options
  - Processors
  - Processor Upgrade Kit
  - Flash Memory Cards
  - Interface Processors
  - Spare Chassis
  - Power Supplies
  - Fans and Filters
  - Spare Accessories
  - Software Options

Note Documentation for the Cisco 7000 series is available in two forms: on a CD-ROM called Cisco Connection Documentation, Enterprise Series (formerly called UniverCD) and printed books. You can request a free copy of the documentation CD when you place an order and have the option of subscribing to a CD update service. Installation documentation ships with each chassis, and a configuration note ships with each component ordered. All configuration notes are available on the CD.

You can also access Cisco technical documentation on the World Wide Web URL http://www.cisco.com. For more information, see the chapter “Documentation” at the end of the catalog.

Product Overview

The Cisco 7000 series of multiprotocol routers includes the Cisco 7000 and the Cisco 7010. These routers combine Cisco Systems' proven software technology with exceptional reliability, availability, serviceability, and performance features to meet the requirements of today's most mission-critical internetworks. The Cisco 7000 series provides information system professionals with the flexibility they need to meet the constantly changing requirements at the core and distribution points of the internetwork. The Cisco 7000 series also provides a clear migration path to tomorrow's technologies.

Network interfaces reside on modular interface processors, which provide a direct connection between the high-speed Cisco Extended Bus (CxBus) and the external network. In a standard Cisco 7000 series router, route processing and switching are accomplished by the Route Processor (RP), Switch Processor (SP), and Silicon Switch Processor (SSP). In a Cisco 7000 series router upgraded to Cisco 7500 functionality, route processing and switching are accomplished by the Route Switch Processor (RSP7000).

The Cisco 7000 series runs the Cisco Internetwork Operating System (Cisco IOS) software, Cisco's industry-leading networking software. Cisco IOS software assures robust, reliable internetworks by supporting both LAN and WAN protocols, optimizing WAN services, and controlling internetwork access. In addition, Cisco IOS software allows centralized, integrated, and automated installation and management of internetworks.

The Cisco 7000 router provides five slots for interface processors; the Cisco 7010 router provides three slots for interface processors. Following are the interface processor types:

- Asynchronous Transfer Mode (ATM) Interface Processor (AIP)*
- Channel Interface Processor (CIP)
- Ethernet Interface Processor (EIP)*
- Fast Ethernet Interface Processor (FEIP)
- FDDI Interface Processor (FIP)*
- Fast Serial Interface Processor (FSIP)*
- High-Speed Serial Interface (HSSI) Interface Processor (HIP)
- MultiChannel Interface Processor (MIP)
- Packet OC-3 Interface Processor (POSIP)
- Service Provider MultiChannel Interface Processor (SMIP)
- Standard Serial Interface Processor (SSIP)
- Token Ring Interface Processor (TRIP)

- Versatile Interface Processor (VIP)
- Second-Generation Versatile Interface Processor (VIP2)

* Older versions of these boards may be eligible for the Investment Protection Program (IPP). See the chapter “Interface Processors for the Cisco 7000 Family.”

The reliability, availability, and serviceability features of the Cisco 7000 series include the following:

- Online software reconfiguration—Enables software configuration changes to occur without rebooting or interrupting network applications and services.
- Online insertion and removal—Allows seamless upgrades to higher density and new interface processors without rebooting or taking the system offline. Reduces operator intervention because like interface processors are automatically reconfigured.
- Fast boot—Enables the system to come online quickly (35 seconds is typical) after software upgrades, minimizing impact on the network.
- Environmental monitoring—Alerts you to fluctuations before critical conditions occur, allowing proactive resolution while the system stays online.
- Self-diagnostics and tools—Ensures that modules are operational before going online, eliminating potential network problems.
- Optional dual power supply systems (Cisco 7000 only)—Extends individual power supplies by load sharing.

  Allows you to implement dual sources of prime power. Each supply has its own power cord, eliminating the risks associated with failure of uninterruptable power supply systems or building power.
- Flash memory and EPROM—Enables fast, reliable software and microcode upgrades. Allows a single, centralized point of administration, obviating the need to visit each router site when upgrading software or microcode.

Figure 9 Cisco 7000 Series

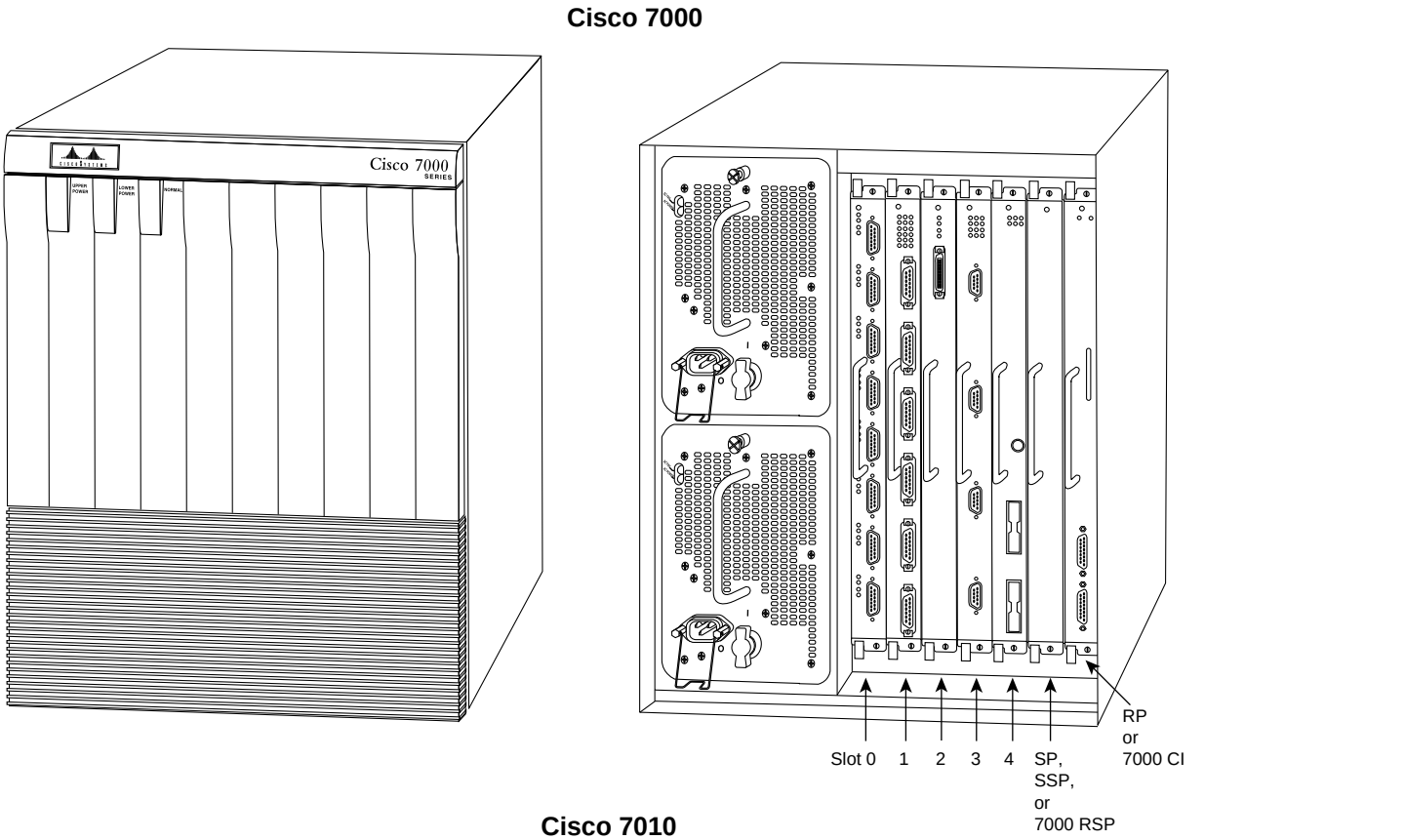


Table 64 Cisco 7000 Series Summary of Features

Characteristics	Cisco 7000	Cisco 7010
Supported network interfaces	Ethernet 10BaseT and AUI[1] Fast Ethernet (100BaseT and MII) Token Ring FDDI HSSI Serial ATM Multichannel on T1 or E1 lines, ISDN PRI IBM channel	Ethernet 10BaseT and AUI[1] Fast Ethernet (100BaseT and MII) Token Ring FDDI HSSI Serial ATM Multichannel on T1 or E1 lines, ISDN PRI IBM channel
Power supplies	2	1
Interface processor slots	5	3
Software options—for Cisco IOS Release 11.0 and 11.1, choice of six software feature sets[2]	IP routing IP/IPX Routing and IBM IP/IPX Routing, IBM, and APPN Desktop and IBM Enterprise and IBM Enterprise, IBM, and APPN	IP routing IP/IPX Routing and IBM IP/IPX Routing, IBM, and APPN Desktop and IBM Enterprise and IBM Enterprise, IBM, and APPN
Onboard Flash memory	RP: 4 MB standard	RP: 4 MB standard
PCMCIA Flash memory card	RP: Optional 8 or 16 MB RSP7000: 8 MB expandable to 40 MB (8, 16, or 20 MBs per card), 2 slots available	RP: Optional 8 or 16 MB RSP7000: 8 MB expandable to 40 MB (8, 16, or 20 MBs per card), 2 slots available
Processor type	RP: 25-MHz 68040 CPU, 16-MB RAM, 64-MB option available RSP7000: MIPS RISC	RP: 25-MHz 68040 CPU, 16-MB RAM, 64-MB option available RSP7000: MIPS RISC
Dimensions (H x W x D)	19.25 x 17.5 x 24.1" (48.9 x 44.45 x 61.34 cm)	10.5 x 17.5 x 17" (26.67 x 44.45 x 43.18 cm)
Weight (average shipping)	~149 lb (~67.6 kg) with 5 interface processors and 2 power supplies	~83 lb (~37.65 kg) with 3 interface processors and 1 power supply

1. AUI = attachment unit interface.
2. Feature sets can be enhanced with VIP support, CIP support, and/or two feature licenses (WAN packet protocols and interdomain routing).

Table 65 Cisco 7000 Series Environmental Specifications

Description	Cisco 7000	Cisco 7010
AC-input power supplies	700W (2380 Btu/hour)	600W (2040 Btu/hour)
DC-input power supplies	1000W input requirement 700W power output 300W (1024 Btu/hr) heat dissipation 20A (-48 VDC)	800W input requirement 600W power output 300W (1024 Btu/hr) heat dissipation 18A (-40 VDC)
Input	100 to 240 VAC autoranging	100 to 240 VAC autoranging
Frequency	50 to 60 Hz autoranging	50 to 60 Hz autoranging
AC current rating	12A @ 100V; 6A @ 240V	9A @ 100V; 4A @ 240V

Description	Cisco 7000	Cisco 7010
Airflow	140 cfm through the system blower	Side-to-side through chassis by variable-speed, 6-fan array
Radiated acoustic noise	62 dBa	47 dBa
Operating temperature	32 to 104 F (0 to 40 C)	32 to 104 F (0 to 40 C)
Nonoperating temperature range	–40 to 185 F (–40 to 85 C)	–4 to 149 F (–20 to 65 C)

Standard Features

The Cisco 7000 series base system includes the following standard features:

- System chassis, which includes a single power supply
- Three slots for interface processors for the Cisco 7010; five slots for interface processors for the Cisco 7000
- AC-input and DC-input power supplies
- Dual AC-input and DC-input power supplies (Cisco 7000 only)
- Power cord (AC only)
- Rack-mounting hardware
- Cable-management brackets (Cisco 7010 only)
- Standard system:
  - Route Processor:

    25-MHz 68040 CPU

    Console port (female EIA/TIA-232—DCE mode)

    Auxiliary port (EIA/TIA-232 DTE)

    16-MB DRAM, upgradeable to 64 MB

    8-MB ROM

    4-MB Flash EPROM for downloadable microcode and software updates

    128-KB NVRAM

    Slot for optional 8- or 16-MB Flash memory credit card

    Real-time calendar clock with battery backup

  - Switch Processor:

    Controls communication between the CxBus interface processors and the system processor

    Three models available:
    SP—Switch Processor (default model)
    SSP—Silicon Switch Processor with 512-KB spare
    SSP-2MB—Silicon Switch Processor with 2-MB spare

- Upgraded RSP7000 system:
  - MIPS RISC CPU, external clock speed of 50 MHz and an internal clock speed of 100 MHz
  - Console port (male EIA/TIA-232—default DCE mode)
  - Auxiliary port (EIA/TIA-232 DTE)
  - 16-MB DRAM default, upgradeable to 128 MB (user configurable)
  - 128-KB NVRAM
  - 8-MB Flash memory via PCMCIA Flash memory cards, upgradeable to 40 MB (user configurable)
  - Battery backup
  - Real-time calendar clock

Options

Options for the Cisco 7000 series include processors, interface processors, serial cables, software features, software feature licenses, memory, a second power supply (Cisco 7000 only), and accessories.

If a product number ends with an equal sign (=), the item can be ordered only as a spare. If a product number does not end with an equal sign, the item can be ordered as a spare or as a configurable part of a system order.

Note For additional options that apply to most systems, refer to the chapters “Cables and Transceivers” or “Power Cords” in Part 7.

Processors

The standard system requires one Route Processor and one Switch Processor. An upgraded RSP7000 system requires one Route Switch Processor (RSP7000) and one chassis interface (RSP7000CI). Most processors can be ordered in three ways: as part of an initial system, as spares, or as upgrades. The product numbers are listed in Table 66.

Table 66 Cisco 7000 Series Processor Boards

Description	Product Number
Route Processor (installed in a system)	RP
Route Processor (spare)	RP=
Route Processor with 64-MB RAM (installed in a system)	RP-64MB
Route Processor with 64-MB RAM (spare)	RP-64MB=
Switch Processor (installed in a system)	SP
Switch Processor (spare)	SP=

Description	Product Number
Silicon Switch Processor with 512 KB of packet memory[1] (installed in a system)	SSP
Silicon Switch Processor with 512 KB of packet memory (spare)	SSP=
Silicon Switch Processor with 2 MB of packet memory[2] (installed in a system)	SSP-2MB
Silicon Switch Processor with 2 MB of packet memory[2] (spare)	SSP-2MB=
Upgrade from RP to RP-64MB[3]	RP-64MB-U
Upgrade from SP to SSP[3]	UPG-SSP
Route Switch Processor (installed in system)[4]	RSP7000
Route Switch Processor Chassis Interface (installed in system)[4]	RSP7000CI
Upgrade from SP to SSP-2MB[3]	UPG-SSP-2MB
Upgrade from SSP to SSP-2MB[3]	UPS-SSP-.5to2MB
Upgrade kit for both RP and SP	UPG-RSP7000=

1. Requires Cisco IOS Release 10.0 or later.
2. Requires Cisco IOS Release 10.0 or later, with Releases 10.0(11), 10.2(7), and 10.3(4) recommended.
3. The original (replaced) part must be returned to Cisco.
4. For more information, see the section “Processor Upgrade Kit.”

Processor Upgrade Kit

Cisco offers the RSP7000, which is available as an upgrade kit for the installed base of Cisco 7000 and 7010 systems. The RSP7000 significantly increases the performance for most features and protocols and provides a migration path that enables Cisco 7000 and 7010 systems to take advantage of advanced VIP features.

Note Cisco IOS Release 10.3(9), 11.0(6), 11.1(1) and later support the RSP7000 upgrade.

The RSP7000 upgrade consists of the following:

- Upgrade instructions (included in upgrade kit)
- RSP7000 processor board shown in Figure 10 (included in upgrade kit)
- RSP7000CI chassis interface board shown in Figure 11 (included in upgrade kit)
- PCMCIA Flash memory card (8 MB is default if not specified)
- Cisco 7500 RSP software licenses (must be ordered with upgrade kit)

These software licenses and boards replace existing Cisco 7000 software licenses, RP boards, and SP/SSP boards, all of which are returned to Cisco for a credit.

Figure 10 RSP7000 Processor Board

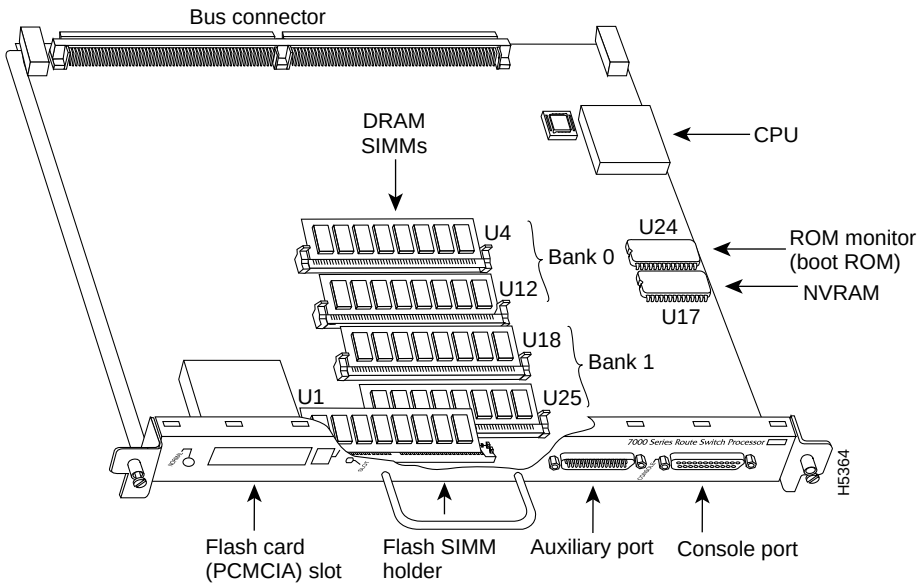
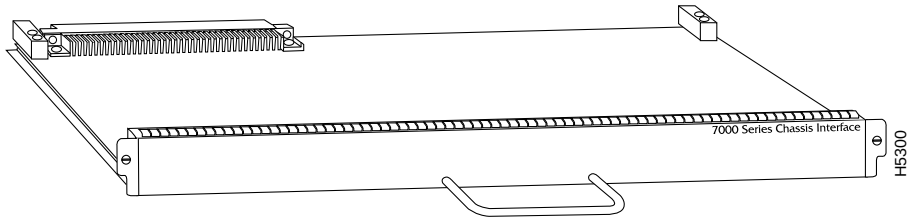


Figure 11 RSP7000CI Chassis Interface Board



The following figures (Figure 12 and Figure 13) show Cisco 7000 series routers after installation of the RSP7000 upgrade kit. Note that each upgrade must also include an RSP software license.

Figure 12 Cisco 7000 with RSP7000 and RSP7000CI Installed

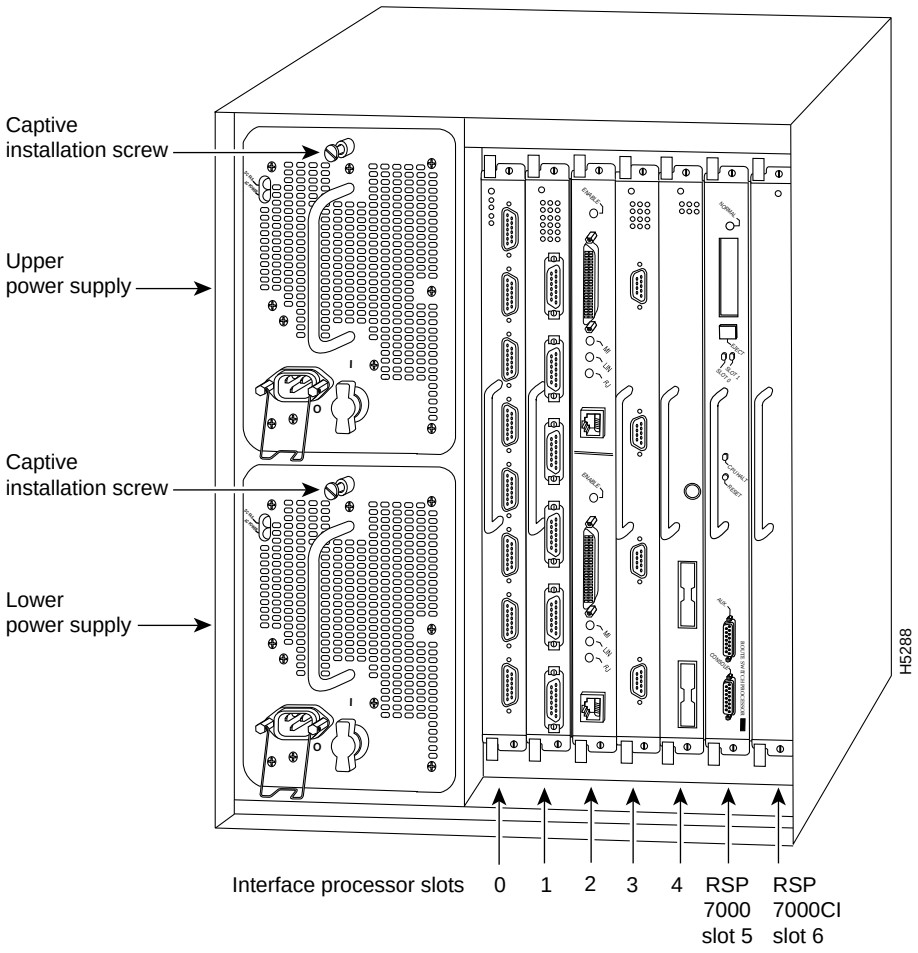
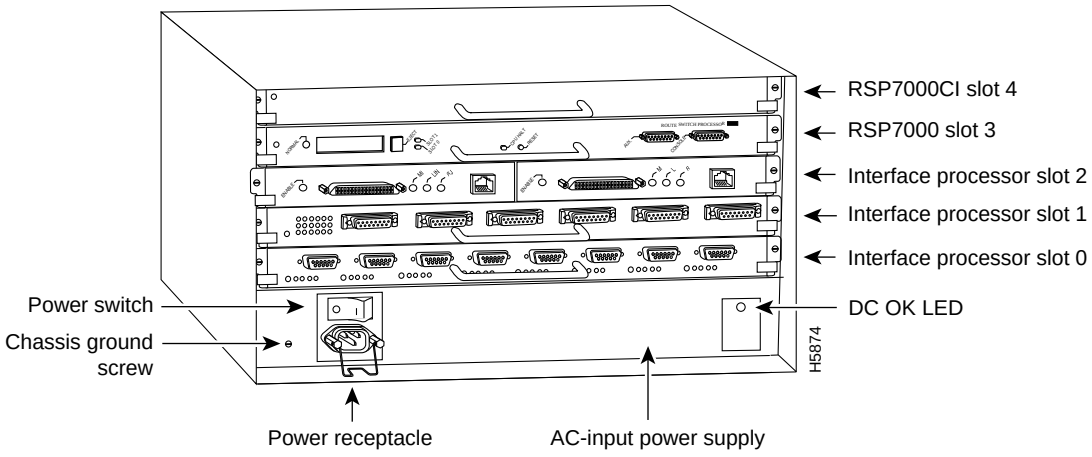


Figure 13 Cisco 7010 with RSP7000 and RSP7000CI Installed



The RSP7000 has the same interface processor compatibility requirements as the Cisco 7500 series router, or more specifically, the RSP1 and RSP2. To determine if your interface processor boards are compatible with the RSP7000, see "Verifying Interface Processor Compatibility" in the chapter "Configuration Guidelines for the Cisco 7000 Family." Cisco offers a program to upgrade noncompatible Cisco 7500 series interface processor boards. If needed, refer to "Investment Protection Program (IPP)" in the chapter "Interface Processors and Port Adapters for the Cisco 7000 Family."

Note In Cisco 7000 routers, the RSP7000 must be installed in the SP (or SSP) slot, and the RSP7000CI must be installed in the RP slot.

When you order the upgrade kit, specify the following:

- A Flash memory card (an 8-MB card is the default included with a kit)
- RSP DRAM (see the section "DRAM Guidelines" in the chapter, "Configuration Guidelines for the Cisco 7000 Family")
- One of the Cisco 7500 feature sets listed in Table 61 in the chapter "Cisco 7500 Series."

Note You can order a Cisco 7000 series router with the upgrade kit installed at the factory. On your order, specify the RSP7000 and RSP7000CI instead of the default RP and SSP boards. In addition, you must order a Cisco 7500 software license.

The RSP7000 cannot be used in a Cisco 7500 series router, and the RSP1 or RSP2 cannot be used in a Cisco 7000 series router.

Flash Memory Cards

A Flash memory card allows you to download a software image into Flash memory, save backup software images, and copy files. Flash memory card options depend on the processor (RP or RSP7000) installed in your router.

RP Flash Memory Cards

The RP requires a PCMCIA Flash memory card for Cisco IOS Release 11.0 or later. The card allows you to download Release 11.0 into Flash memory, save backup software images, and copy files. Table 67 lists RP Flash memory card product numbers and descriptions.

Table 67 Cisco 7000 Series RP Flash Memory Cards

Description	Product Number
8-MB Flash memory card with sleeve (installed in system)	MEM-RP-FLC8M
8-MB Flash memory card with sleeve (spare)	MEM-RP-FLC8M=
16-MB Flash memory card with sleeve (installed in system)	MEM-RP-FLC16M
16-MB Flash memory card with metal sleeve (spare)	MEM-RP-FLC16M=

The Flash memory card inserts into the PCMICA slot on the RP board. The following purchase scenarios explain how to use the Cisco 7000 series router Flash memory card:

- Ordering a new router with Cisco IOS Release 11.0 or later:
  - MEM-RP-FLC8M or MEM-RP-FLC16M
  - SW-G7-11.0 (software on ROMs in RP)
- Upgrading an existing router to Cisco IOS Release 11.0 or later with a Flash memory card:
  - MEM-RP-FLC8M= or MEM-RP-FLC16M=
  - SWR-G7-11.0= (software ROMs—sold as spare or free for SMARTnet customers)
  - Note that in order to boot from the Flash memory card, you must update ROMs one time to Cisco IOS Release 11.0 or later
- Upgrading an existing router to Cisco IOS Release 11.0 or later without a Flash memory card:
  - SWR-G7-11.0 (software ROMs—free for SMARTnet customers)
  - You will need to change ROMs every time you want a software upgrade to an image that exceeds 4-MB onboard Flash memory
  - Note that in order to boot from the Flash memory card, you must update ROMs one time for Cisco IOS Release 11.0 or later
- Upgrading an existing router with Cisco IOS 11.0 software without PCMCIA Flash memory to Cisco IOS software with PCMCIA Flash memory. In this scenario, you buy Cisco IOS Release 11.0 and want to upgrade to Release 11.1 (you already have 11.0 ROMs, but do not have Flash memory).
  - MEM-RP-FLC8M= or MEM-RP-FLC16M=
  - Software on diskette (SW-G7-xxxx) or from a TFTP server

Note The Flash memory card for the RP is Intel Series 2+. This is the same Flash memory card used for the RSP7000, RSP1, and RSP2. The Flash memory card is interchangeable; however, the specific product numbers mentioned here must be used, because the RP products include a special metal sleeve that is necessary for installing a Flash memory device in the RP.

RSP7000 Flash Memory Cards

In an RSP7000 system, Flash memory cards can be used to store and boot Cisco IOS images and/or system configurations. An RSP7000 system can also be used as a TFTP server, with the Flash card memory used to store other files such as software and microcode images for other systems. Cisco recommends using one card for image storage, and another for configurations. The number of system images that can be stored on the card depends both on the Flash card size and the file size.

The RSP7000 Flash memory card is available in 8-, 16-, or 20-MB densities. The card is an Intel Series 2+ Flash memory card, which conforms with the PCMCIA format. The Flash memory card that is shipped with the RSP7000 contains a software image; the same Flash memory card that is ordered as a spare is shipped blank and must be formatted before use. Table 68 lists RSP7000 Flash memory card product numbers and descriptions.

Table 68 Cisco 7000 Series RSP7000 Flash Memory Cards

Description	Product Number
8-MB Flash memory card (default, shipped with RSP)	MEM-RSP-FLC8M
8-MB Flash memory card (spare)	MEM-RSP-FLC8M=[1]
16-MB Flash memory card (installed in system)	MEM-RSP-FLC16M
16-MB Flash memory card (spare)	MEM-RSP-FLC16M=[1]
20-MB Flash memory card (installed in system)	MEM-RSP-FLC20M
20-MB Flash memory card (spare)	MEM-RSP-FLC20M=[1]

1. Spares are shipped blank and unformatted.

RSP7000 Memory Options

Be default, the RSP7000 is shipped with 16-MB DRAM. Table 69 describes additional memory options. For configuration information, see the section “DRAM Guidelines” in the chapter “Configuration Guidelines for the Cisco 7000 Family.”

Table 69 Cisco 7500 Series Route Switch Processor DRAMs

Description	Product Numbers	SIMM Quantity	SIMM Size
8-MB DRAM (spare)	MEM-RSP-8M=	2	4-MB SIMMs
16-MB DRAM (default, shipped with RSP)	MEM-RSP-16M	2	8-MB SIMMs
16-MB DRAM (spare)	MEM-RSP-16M=	2	8-MB SIMMs
24-MB DRAM (installed in system)	MEM-RSP-24M	2 2	8-MB SIMMs 4-MB SIMMs
32-MB DRAM (installed in system)	MEM-RSP-32M	2	16-MB SIMMs
32-MB DRAM (spare)	MEM-RSP-32M=	2	16-MB SIMMs
64-MB DRAM (installed in system)	MEM-RSP-64M	2	32-MB SIMMs
64-MB DRAM (spare)	MEM-RSP-64M=	2	32-MB SIMMs
128-MB DRAM (installed in system)	MEM-RSP-128M	4	32-MB SIMMs
128-MB DRAM (spare)	MEM-RSP-128M=	4	32-MB SIMMs

Interface Processors

Interface processors for the Cisco 7000 series are described in the chapter "Interface Processors and Port Adapters for the Cisco 7000 Family." Cisco 7000 series interface processors support the following interfaces:

- Fast Ethernet—one or two 100-Mbps port(s)
- Ethernet—two, four, or six 10-Mbps ports
- Token Ring—two or four ports
- FDDI—one port: multimode and multimode, single-mode and single-mode, multimode and single-mode, or single-mode and multimode

- HSSI—one port
- POSIP—one port: 155.520 Mbps, OC-3c, single-mode, simplex or duplex
- Serial—four or eight ports
- ATM—one port: E3 coaxial, DS3 coaxial, TAXI multimode, SONET multimode, or SONET single-mode
- MultiChannel—one or two channelized ports: T1/ PRI; E1/ PRI 75 ohm balanced; or E1/ PRI 120 ohm balanced
- IBM Channel—Single or dual parallel (bus and tag) channel interface, single or dual Enterprise System Connection (ESCON) channel interface, or single ESCON channel interface and parallel channel interface port(s)

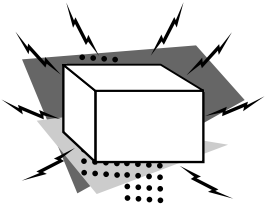
Spare Chassis

Table 70 lists spare chassis assemblies.

Table 70 Cisco 7000 Series Chassis Assemblies

System[1]	Product Number
Cisco 7000 and AC-input power supply. Includes blower, rack-mount kit, and cable management bracket.	CHAS-7000=
Cisco 7010 and AC-input power supply. Includes blower, rack-mount kit, and cable management bracket.	CHAS-7010=
Cisco 7000 and DC-input power supply. Includes blower and rack-mount kit.	CHAS-7000-DC=
Cisco 7010 and DC-input power supply. Includes blower and rack-mount kit.	CHAS-7010-DC=

1. Each order must include software.



Power Supplies

Table 71 provides product numbers for single power supplies ordered as part of an initial system.

Table 71 Cisco 7000 Series Single Power Supplies

Description	Product Number
Cisco 7000 AC-input power supply (default)[1]	PWR/7
Cisco 7010 AC-input power supply (default)[2]	PWR/5
Cisco 7000 DC-input power supply[1, 3]	PWR/7-DC
Cisco 7010 DC-input power supply[2, 3]	PWR/5-DC

1. Same power supply as the Cisco 7507 router and can be used interchangeably.
2. Same power supply as the Cisco 7505 router and can be used interchangeably.
3. DC-input power supplies do not include a power cord.

The Cisco 7000 supports dual power supplies. (This option is not available for the Cisco 7010.) The optional additional power supply system provides dual load-sharing for protection against system interruption in the event that one power supply system or one source of power fails. Table 72 provides product numbers for dual power supplies.

Table 72 Cisco 7000 Dual Power Supplies

Description	Product Numbers
Redundant AC-input power supply (installed in system)	PWR/7/2[1]
Redundant DC-input power supply (installed in system)[2]	PWR/7/2-DC[1]

1. Same power supply as the Cisco 7507 router and can be used interchangeably
2. DC-input power supplies do not include a power cord.

When you order an AC-input power supply as a spare, choose the appropriate product numbers to specify the type of power cord to be included in the order. Table 73 provides the spare power supply product numbers. Note that the Cisco 7000 power supply is the same as the Cisco 7507 power supply; the Cisco 7010 power supply is the same as the Cisco 7505 power supply.

Table 73 Cisco 7000 Series Spare AC-input Power Supply Product Numbers

System	Country	Product Number
Cisco 7000	Australia	PWR/7-ACA=
	Europe	PWR/7-ACE=
	Italy	PWR/7-ACI=
	United Kingdom	PWR/7-ACU=
	USA	PWR/7-AC=
Cisco 7010	Australia	PWR/5-ACA=
	Europe	PWR/5-ACE=
	Italy	PWR/5-ACI=
	United Kingdom	PWR/5-ACU=
	USA	PWR/5-AC=

Fans and Filters

Spare fans and filters for the Cisco 7000 series are listed in Table 74.

Table 74 Cisco 7000 Series Spare Fans and Filters

Fans	Power	Systems	Product Number
Blower assembly kit	All	Cisco 7000	MAS/7-FAN=
Fan tray assembly	All	Cisco 7010	MAS/5-FAN=
Air filter	–	Cisco 7000	ACS/7-FILTER=

Spare Accessories

Several spare accessories are available for the Cisco 7000 series, including a rack-mount kit and the following spares: LED board, panel, arbiter, air filter, and blank carrier. Table 75 lists the Cisco 7000 series spare accessories.

Table 75 Cisco 7000 Series Accessories

Product	Description	Cisco 7000 Product Number	Cisco 7010 Product Number
Rack-mount kit	Standard EIA 19-inch rack-mount kit	ACS-RMK=	ACS/5-RMK=
Cable system	Cable management system	–	ACS/5-CBLM=
LED board	The LED board provides system status indications	MAS-7000LED=	–
Spare packaging	Spare packaging material	PKG-7000=	PKG-7010=
Fan assembly	Fan or blower assembly	MAS-7000FAN=	MAS-7010FAN=
Air filter	Air filter for fan assembly	ACS/7-FILTER=	–
Blank carrier	Blank carrier for empty chassis slots[1]	MAS-7KBLANK=	MAS-7KBLANK=

1. The factory fills all empty interface processor slots with blank carriers.

Software Options

Cisco IOS software feature sets are now available for Cisco 7000 series routers. With feature sets, you can order software combinations that support your particular application. Optional licenses expand the feature sets by providing WAN packet protocol and interdomain routing. To order, select one feature set (there is no default) and one or both of the optional feature licenses.

Table 76 lists the Cisco IOS Release 11.1 feature sets; Table 77 lists the Cisco IOS Release 11.0 feature sets; Table 78 lists feature set product numbers; Table 79 and Table 80 list feature set licenses; and Table 81 and Table 82 list feature set upgrade product numbers. (For additional details about how to order software updates and upgrades, see the section “Software Ordering Examples” in the chapter “Cisco IOS Software.”)

You can still order earlier Cisco IOS software releases that are available as software feature sets. Unless you specify otherwise, you will receive the default software version.

Table 76 Cisco IOS Release 11.1 Feature Sets—Cisco 7000 Series

Category	IP Routing	IP/IPX Routing and IBM[1]	Desktop and IBM	Enterprise[1]
LAN support	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE, Novell IPX	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV, DECnet V, OSI, XNS, Banyan VINES, Apollo Domain
WAN services	HDLC, PPP[4], ISDN[5]	HDLC, PPP[4], ISDN[5], IPXWAN 2.0	HDLC, PPP[4], ISDN[5], IPXWAN 2.0	HDLC, PPP[4], ISDN[5], IPXWAN 2.0
WAN optimization	Header, link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing[7], weighted fair queuing[7], snapshot routing	Header[8], link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing[7], weighted fair queuing[7], snapshot routing	Header[8], link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing[7], weighted fair queuing[7], snapshot routing	Header[8], link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing[7], weighted fair queuing[7], snapshot routing
IP routing	RIP, RIPv2, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing	RIP, RIPv2, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing	RIP, RIPv2, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing	RIP, RIPv2, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing, ES-IS, IS-IS
Other routing	–	IPX RIP, NLSP	IPX RIP, NLSP, RTMP, AURP, SMRP	IPX RIP, NLSP, RTMP, AURP, SMRP, SRTP
Management	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration[10]	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration[10]	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration[10]	AutoInstall, SNMP, RMON events and alarms[9], Telnet, automatic modem configuration
Security	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key	Access lists, extended access lists, access security, TACACS+, RADIUS, MD5 routing authentication, Lock and Key, Kerberized login
IBM support	–	SRB/RSRB, SRT, DLSw+[11], SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), QLLC, NetView Native Service Point, BAN for SNA Frame Relay Support Optional[12]: APPN	SRB/RSRB, SRT, DLSw+[11], SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), QLLC, NetView Native Service Point, BAN for SNA Frame Relay Support	SRB/RSRB, SRT, DLSw+[11] SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), BAN for SNA Frame Relay Support, TG/COS, QLLC, NetView Native Service Point Downstream PU Concentration (DSPU) Optional[12]: APPN

Category	IP Routing	IP/IPX Routing and IBM[1]	Desktop and IBM	Enterprise[1]
VIP support	Use VIP software product numbers specified in Table 78	Use VIP software product numbers specified in Table 78	Use VIP software product numbers specified in Table 78	Use VIP software product numbers specified in Table 78
VIP2[13]	Use VIP software product numbers specified in Table 78	Use VIP software product numbers specified in Table 78	Use VIP software product numbers specified in Table 78	Use VIP software product numbers specified in Table 78

1. Also available with APPN for Cisco IOS Release 11.1. Use the product numbers in Table 78 that specify APPN.
2. See the category "IBM Support" for information about source-route bridging (SRB).
3. Concurrent routing and bridging feature only applies to transparent bridging, not SRB.
4. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, and PPP compression.
5. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features. Asynchronous ISDN Access (V.120) is only supported in the Enterprise feature set.
6. X.25 and Frame Relay payload compression.
7. Not currently supported on SMIP or MIP cards. Will be supported in future Cisco IOS releases.
8. IPX header compression (RFC 1553) is available in Cisco 10S Release 11.1(1) and later.
9. Supported on all interfaces.
10. Supported in all feature sets for Cisco IOS 11.1(2). Supported only in Enterprise for Cisco IOS 11.1(1).
11. DLSw+ over TCP/IP is supported.
12. "Optional" means separate Cisco IOS feature sets: IP/IPX/IBM base/APPN and Enterprise/APPN, as described in Table 78.
13. VIP2 requires Cisco IOS Release 11.1(472) or later.

Note In some configurations, Cisco IOS Release 11.1 requires additional memory. For more information, see the section "DRAM Guidelines" in the chapter "Configuration Guidelines for the Cisco 7000 Family."

Table 77 Cisco IOS Release 11.0 Feature Sets—Cisco 7000 Series

Category	IP Routing	IP/IPX Routing and IBM[1]	Desktop and IBM	Enterprise[1]
LAN support	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE, Novell IPX	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV	IP, transparent and translational bridging[2], concurrent routing and bridging[3], multiring, LAN extension host, GRE, Novell IPX, AppleTalk 1 and 2, DECnet IV, DECnet V, OSI, XNS, Banyan VINES, Apollo Domain
WAN services	HDLC, PPP[4], ISDN[5]	HDLC, PPP[4], ISDN[5], IPXWAN 2.0	HDLC, PPP[4], ISDN[5], IPXWAN 2.0	HDLC, PPP[4], ISDN[5], IPXWAN 2.0
WAN optimization	Header, link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing, weighted fair queuing, snapshot routing	Header, link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing, weighted fair queuing, snapshot routing	Header, link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing, weighted fair queuing, snapshot routing	Header, link and payload compression[6], dial-on-demand, dial backup, bandwidth-on-demand, custom and priority queuing, weighted fair queuing, snapshot routing
IP routing	RIP, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing	RIP, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing	RIP, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing	RIP, IGRP, Enhanced IGRP, OSPF, PIM, NHRP, policy-based routing, ES-IS, IS-IS
Other routing	–	IPX RIP, NLSP	IPX RIP, NLSP, RTMP, AURP, SMRP	IPX RIP, NLSP, RTMP, AURP, SMRP, SRTP

Category	IP Routing	IP/IPX Routing and IBM[1]	Desktop and IBM	Enterprise[1]
Management	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet	AutoInstall, SNMP, Telnet
Security	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication	Access lists, extended access lists, access security, TACACS+, MD5 routing authentication
IBM support	–	SRB/RSRB, SRT, DLSw+[7], SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), QLLC, NetView Native Service Point Optional[8]: APPN	SRB/RSRB, SRT, DLSw+[7], SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), QLLC, NetView Native Service Point	SRB/RSRB, SRT, DLSw+[7], SNA and NetBIOS WAN optimization via local acknowledgment, caching and filtering, SDLC integration, SDLC-to-LAN conversion (SDLLC), SDLC transport (STUN), Frame Relay SNA Support (RFC 1490), TG/COS, QLLC, NetView Native Service Point Downstream PU Concentration (DSPU) Optional[8]: APPN

1. Also available with APPN for Cisco IOS Release 11.0. Use the product numbers listed in Table 78.
2. See the category "IBM Support" for information about source-route bridging (SRB).
3. Concurrent routing and bridging feature only applies to transparent bridging, not SRB.
4. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, and PPP compression.
5. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
6. X.25 payload compression. Frame Relay payload compression was first supported in Cisco IOS Release 11.0(4).
7. DLSw+ over TCP/IP is supported.
8. "Optional" means separate Cisco IOS feature sets: IP/IPX/IBM base/APPN and Enterprise/APPN, as described in Table 78.

Table 78 Cisco IOS Software Product Numbers—Cisco 7000 Series

Description	Cisco IOS Release 11.1	Cisco IOS Release 11.0	Cisco IOS Release 10.3
RP systems			
Enterprise	SW-G7A-11.1.x[1] SWR-G7A-11.1.x=	SW-G7A-11.0.x[1] SWR-G7A-11.0.x=	SW-G7A-10.3.x[1] SW-G7A-10.3.x= SWR-G7A-10.3.x=
Enterprise, VIP/VIP2[2]	SW-G7AV-11.1.x SWR-G7AV-11.1.x=	–	–
Enterprise, APPN	SW-G7AN-11.1.x SWR-G7AN-11.1.x=	SW-G7AN-11.0.x SWR-G7AN-11.0.x=	–
Enterprise, APPN, VIP/VIP2[2]	SW-G7ANV-11.1.x SWR-G7ANV-11.1.x=	–	–
Desktop, IBM	SW-G7BS-11.1.x SWR-G7BS-11.1.x=	SW-G7BS-11.0.x SWR-G7BS-11.0.x=	SW-G7BS-10.3.x SW-G7BS-10.3.x= SWR-G7BS-10.3.x=
Desktop, IBM, VIP/VIP2[2]	SW-G7BSV-11.1.x SWR-G7BSV-11.1.x=	–	–
IP/IPX, IBM	SW-G7DS-11.1.x SWR-G7DS-11.1.x=	SW-G7DS-11.0.x SWR-G7DS-11.0.x=	SW-G7DS-10.3.x SW-G7DS-10.3.x= SWR-G7DS-10.3.x=

Description	Cisco IOS Release 11.1	Cisco IOS Release 11.0	Cisco IOS Release 10.3
IP/IPX, IBM, VIP/VIP2[2]	SW-G7DSV-11.1.x SWR-G7DSV-11.1.x=	–	–
IP/IPX, IBM, APPN	SW-G7DSN-11.1.x SWR-G7DSN-11.1.x=	SW-G7DSN-11.0.x SWR-G7DSN-11.0.x=	–
IP/IPX, IBM, APPN, VIP/VIP2[2]	SW-G7DSNV-11.1.x SWR-G7DSNV-11.1.x=	–	–
IP only	SW-G7C-11.1.x SWR-G7C-11.1.x=	SW-G7C-11.0.x SWR-G7C-11.0.x=	SW-G7C-10.3.x SW-G7C-10.3.x= SWR-G7C-10.3.x=
IP, VIP/VIP2[2]	SW-G7CV-11.1.x SWR-G7CV-11.1.x=	–	–
RSP7000 systems			
Enterprise	SF-G75A-11.1.x SW-G75A-11.1.x=	SF-G75A-11.0.x SW-G75A-11.0.x=	SF-G75A-10.3.x SW-G75A-10.3.x=
Enterprise, VIP/VIP2[2]	SF-G75AV-11.1x	–	–
Enterprise, APPN[3]	SF-G75AN-11.1.x SW-G75AN-11.1.x=	SF-G75AN-11.0.x SW-G75AN-11.0.x=	–
Enterprise, APPN, VIP/VIP2[2]	SF-G75ANV-11.1.x	–	–
Desktop, IBM	SF-G75BS-11.1.x SW-G75BS-11.1.x=	SF-G75BS-11.0.x SW-G75BS-11.0.x=	SF-G75BS-10.3.x SW-G75BS-10.3.x=
Desktop, IBM, VIP/VIP2[2]	SF-G75BSV-11.1.x	–	–
IP/IPX, IBM	SF-G75DS-11.1.x SW-G75DS-11.1.x=	SF-G75DS-11.0.x SW-G75DS-11.0.x=	SF-G75DS-10.3.x SW-G75DS-10.3.x=
IP/IPX, IBM, VIP/VIP2[2]	SF-G75DSV-11.1.x	–	–
IP/IPX, IBM, APPN	SF-G75DSN-11.1.x SW-G75DSN-11.1.x=	SF-G75DSN-11.0.x SW-G75DSN-11.0.x=	–
IP/IPX, IBM, APPN, VIP/VIP2[2]	SF-G75DSNV-11.1.x	–	–
IP only	SF-G75C-11.1.x SW-G75C-11.1.x=	SF-G75C-11.0.x SW-G75C-11.0.x=	SF-G75C-10.3.x SW-G75C-10.3.x=
IP, VIP/VIP2[2]	SF-G75CV-11.1.x	–	–

1. Where x represents the current maintenance release number.
2. VIP2 requires Cisco IOS Release 11.1(472) or later, for example, SWG7AV-11.1.472.
3. See “DRAM Guidelines” in the chapter “Configuration Guidelines for the Cisco 7000 Family.”

Table 79 Cisco IOS Software Feature Licenses—Cisco 7000 Series, RP

Category	Features	Product Number
WAN packet protocols	X.25, X.25 switching, Switched 56, Frame Relay, Frame Relay switching, SMDS, ATM DXI, SMDS over ATM	FR-WPP7 FR-WPP7=
Interdomain routing[1]	BGP, EGP for Internet scale routing	FR-IR7 FR-IR7=
VIP/VIP2 support[2,3]	Enables VIP or VIP2 board to run Cisco IOS kernel and DSW	VIPIOS/DSW
CIP support[4]	TCP/IP offload feature for CIP	FR-CIP-TCPOFF FR-CIP-TCPOFF=
	SNA support feature for CIP SNA	FR-CIP-CSNA FR-CIP-CSNA=

1. Interdomain routing is automatically included with all Cisco 7000 series RPs with 16-MB RAM. However, this option is appropriate for all other Cisco 7000 and 7500 series system processors.
2. Any order for a VIP or VIP2 board automatically includes this software at no extra charge.
3. VIP2 requires Cisco IOS Release 11.1(472) or later.
4. Any order for a CIP board must include one or both of the software features. To calculate CIP memory requirements, see the section “CIP Memory Guidelines” in the chapter “Configuration Guidelines for the Cisco 7000 Family.”

Table 80 Cisco IOS Software Feature Licenses—Cisco 7000 Series, RSP7000

Category	Features	Product Number
WAN packet protocols	X.25, X.25 switching, Frame Relay, SMDS, Frame Relay switching, ATM DXI, SMDS over ATM	FR-WPP75 FR-WPP75=
Interdomain routing[1]	BGP, EGP for Internet scale routing	FR-IR75 FR-IR75=
VIP /VIP2 support[2,3]	Enables VIP or VIP2 board to run Cisco IOS kernel and DSW	VIPIOS/DSW
CIP support[4]	TCP/IP offload feature for CIP	FR-CIP-TCPOFF FR-CIP-TCPOFF=
	SNA support feature for CIP SNA	FR-CIP-CSNA FR-CIP-CSNA=

1. Applicable for systems containing more than 16-MB RAM.
2. Any order for a VIP or VIP2 board automatically includes this software at no extra charge. Remember to order VIP software product numbers specified in Table 78.
3. VIP2 requires Cisco IOS Release 11.1(472) or later.
4. Any order for a CIP board must include one or both of the software features. To calculate CIP memory requirements, see the section “CIP Memory Guidelines” in the chapter “Configuration Guidelines for the Cisco 7000 Family.”

Note A Cisco 7000 series router with an RSP7000 upgrade uses Cisco 7500 series software products, which are listed in the previous chapter.

Table 81 Cisco IOS Software Upgrades—Cisco 7000 Series, RP

Feature Set Upgrade	Product Number
IP to IP/IPX and IBM Base Upgrade	FR7-CDS=
IP to Desktop and IBM Base Upgrade	FR7-CBS=
IP to Enterprise Upgrade	FR7-CA=
IP/IPX and IBM to Desktop and IBM Upgrade	FR7-DSBS=
IP/IPX and IBM to Enterprise Upgrade	FR7-DSA=
Desktop and IBM to Enterprise Upgrade	FR7-BSA=
APPN Upgrade (Cisco IOS Release 11.0)	SW-G7NU-11.0.4=
APPN Upgrade (Cisco IOS Release 11.1)	SW-G7NU-11.1.1=
IP/IPX and IBM and APPN to Enterprise and APPN Upgrade (Cisco IOS Release 11.0)	SW-G7DNNU-11.0.4=
IP/IPX and IBM and APPN to Enterprise and APPN Upgrade (Cisco IOS Release 11.1)	SW-G7DNNU-11.1.1=

Table 82 Cisco IOS Software Upgrades—Cisco 7000 Series, RSP7000

Feature Set Upgrade	Product Number
IP to IP/IPX and IBM Base Upgrade	FR75-CDS=
IP to Desktop and IBM Base Upgrade	FR75-CBS=
IP to Enterprise Upgrade	FR75-CA=
IP/IPX and IBM to Desktop and IBM Upgrade	FR75-DSBS=
IP/IPX and IBM to Enterprise Upgrade	FR75-DSA=
Desktop and IBM to Enterprise Upgrade	FR75-BSA=
APPN Upgrade (Cisco IOS Release 11.0)	SW-G75NU-11.0.x=
APPN Upgrade (Cisco IOS Release 11.1)	SW-G75NU-11.1.x=
IP/IPX and IBM and APPN to Enterprise and APPN Upgrade (Cisco IOS Release 11.0)	SW-G75DNNU-11.0.x=
IP/IPX and IBM and APPN to Enterprise and APPN Upgrade (Cisco IOS Release 11.1)	SW-G75DNNU-11.1.x=